

REMARKS

Claims 39, 42 and 45 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Applicant's Prior Art (Fig. 1b) in view of Maruyama. Reconsideration is respectfully requested.

The Office Action asserts that "Applicant's Prior Art (Fig. 1b) discloses a memory device comprised of low profile ball grid array semiconductor packages . . . [with] a single thin layer of material (32) secured to the base substrate [31]." (Office Action, pg. 2). The Office Action further asserts that "Applicant's Prior Art discloses all of the limitations except for the memory device connected to a central processing unit." (Office Action, pg. 2). Applicant respectfully disagrees.

FIG. 1B illustrates "a cross-sectional view of another typical prior art perimeter BGA circuit package 30." (Applicant's specification, pg. 4, lines 13-15) (emphasis added). In Applicant's 'Background of the Invention,' Applicant discloses that BGA packages 10, 30 have several disadvantages . . . [the] height 54 of BGA package 30 is typically on the order of 0.9 to 1.46 mm." (Applicant's specification, pg. 5, lines 18-21). As a result, "there exists a need in the electronics industry for a BGA package that has a very low profile." (Applicant's specification, pg. 5, lines 27-28). Applicant's FIG. 1B does not illustrate a low profile ball grid array package.

Moreover, the Applicant does not merely claim "a single thin layer of material (32) secured to the base substrate [31]," as the Office Action asserts (Office Action, pg. 2). The Applicant claims "a single thin layer of material . . . having a thickness of from approximately 0.025 to less than approximately 0.1 mm," as recited in claims 39, 42 and 45 (emphasis added). The Office Action acknowledges that "Applicant's Prior Art and Maruyama . . . [does not disclose] the single thin material to have a thickness in the range of 0.025 to 0.1 mm."

The Office Action then asserts that it would have been obvious to use a single thin material having a thickness of 0.025 to 0.1 mm. However, Applicant's Prior Art (FIG. 1B) teaches away from a support substrate that is 0.025 to 0.1 mm thick. Applicant's 'Background of the Invention' discloses that "the thickness of substrate 31 and support substrate 32 is generally on the order of 0.35 mm each." (Applicant's specification, pg. 4, lines 20-21) (emphasis added). The ball grid array package illustrated in Applicant's Prior Art (FIG. 1B) does not teach a single layer of material (support substrate 32) 0.025 to 0.1 mm thick. Support substrate 32 is taught to be 0.35 mm thick, or at least three times the thickness of Applicant's claimed single thin layer of material.

Accordingly, Applicant's Prior Art (FIG. 1B) does not teach or suggest the limitations of claims 39, 42 and 45. Specifically, Applicant's Prior Art (FIG. 1B) fails to teach or suggest forming a low profile ball grid array package comprising a "base substrate having a top and bottom surface, with an aperture therein which extends from said top surface to said bottom surface . . . [and] a single thin layer of material secured to said base substrate and covering said aperture such that a cavity is formed . . . having a thickness of from approximately 0.025 to less than approximately 0.1 mm," as claim 39 recites (emphasis added), "a base substrate having a top and bottom surface . . . having an aperture extending from said top surface to said bottom surface . . . [and] a single thin layer of material secured to said top surface of said base substrate and covering said aperture to form a downward facing cavity . . . having a thickness of from approximately 0.025 to less than approximately 0.1 mm," as claim 42 recites (emphasis added), or "a base substrate having a top surface and a bottom surface, with an aperture therein which extends from said top surface to said bottom surface . . . [and] a thin sheet material secured to said base substrate and covering said aperture such that a cavity is formed . . . having a thickness of from approximately 0.025 to less than approximately 0.1 mm," as claim 45 recites (emphasis added).

Maruyama is relied upon for teaching a circuit module that contains a ball grid array package connected to a central processing unit and adds nothing to rectify the deficiencies associated with Applicant's Prior Art (FIG. 1B). For at least the reasons provided above, independent claims 39, 42 and 45 should be allowable over the cited combination of references.

Claims 40, 41, 43 and 44 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Applicant's Prior Art and Maruyama and further in view of Nakashima. Reconsideration is respectfully requested.

The remarks provided above with regard to the rejection of independent claims 39 and 42 in view of Applicant's Prior Art (FIG. 1B) and Maruyama are equally applicable here. Specifically, Applicant's Prior Art (FIG. 1B) and Maruyama does not teach or suggest an "a single thin layer of material . . . having a thickness of from approximately 0.025 to less than approximately 0.1 mm," as recited in independent claims 39 and 42. Nakashima is relied upon for disclosing a single thin layer of material consisting of a metal or polyimide and adds nothing to rectify the deficiencies associated with Applicant's Prior Art (FIG. 1B) and Maruyama.

Claims 40-41 depend from claim 39, and claims 43-44 depend from claim 42. Claims 40-41 and 43-44 contain every limitation of their base claims and should be allowable for at least the same reasons as for allowance of independent claims 39 and 42.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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